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EXAMINER	
KIM, JUNG W	

ART UNIT	PAPER NUMBER
2432	

NOTIFICATION DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/764,645	KHORMAEI ET AL.	
	Examiner	Art Unit	
	JUNG KIM	2432	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This Office action is in response to the amendment filed on 7/28/09.

2. Claims 1-25 are pending.

Response to Amendment

3. The 101 rejections of claims 1-12 are withdrawn in view of the amendments to the claims.

Response to Arguments

4. Applicant's arguments with respect to the prior art rejections have been fully considered but they are not persuasive.

5. Applicant argues in substance that the Tresser prior art does not disclose the new limitations of the claimed invention. However, as outlined below, Tresser expressly discloses the invention in the context of a color halftoning process. See col. 5, lines 6-40. Furthermore contrary to Applicant's arguments that the prior art does not suggest "a halftoning process to create a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art," this feature is a notoriously well known in the art of color halftoning as expressed in Applicant's specification (see pgs. 2-3) and as shown in the list of prior arts listed below; because this technique is well-established in the art, one of ordinary

skill in the art at the time the invention was made would recognize the benefits of utilizing this type of color halftoning technique to modify the invention of Tresser.

6. It is noted that Applicant continues to argue that Tresser is distinguished from their claimed invention because, as interpreted by Applicant, Tresser teaches the image undergoing an intermediate process before being submitted to any halftoning process. See Remarks, pg. 10, first sentence. However, as articulated in the Final rejection mailed on 11/17/08, Applicant's specification defines a digital halftoning process "as a collection of techniques employed by various computer-controlled displays and printing devices for converting continuous-tone images into binary information for displaying the image." (See specification, pg. 3, lines 6-8) This definition is contrary to Applicant's position that the intermediate process disclosed by Tresser is a separate process than the halftoning process. For this reason, the "intermediate process" of Tresser's invention, under the definition provided in Applicant's specification, is clearly part of the halftoning process disclosed in Tresser.

7. Applicant's remaining arguments are derivative of those discussed above, and hence, the claims remain rejected under the prior art of record.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

9. Claims 1-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The independent claims define the limitation "wherein the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap ... [then] submit the generated digital halftone file to a predetermined mathematical process involving each of the plurality of discrete digital values in the digital halftone file to thereby produce a receiver-generated authentication key." Applicant points to paragraph 12 of their application publication for support for the new limitation. However, this portion of the specification merely cites the following:

> Halftone principles and procedures are applicable to color printers as well. In a color printer, the halftone technique is applied to each color plane (usually Cyan, Magenta, Yellow and black (CMYK)). Instead of generating only shades of gray, the printer provides mixtures of varying intensities of the four color planes. Layering of those variable intensity color planes enables the printing of a generally "full color" document.

10. Here, the specification cites that halftone techniques for color printers are known in the art whereby a halftone technique is applied to each color plane. There is no discussion about generating a digital halftone file using a halftone process that creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap and then submitting the generated digital halftone file to a predetermined mathematical process involving each of the plurality of discrete digital values in the digital halftone file to thereby produce a

receiver-generated authentication key, as recited in the claims. In fact, nowhere in the specification is there a disclosure of submitting a digital halftone file constituting a "multi-plane bitmap" to a predetermined mathematical process to produce a receiver-generated authentication key. The relevant portion of the specification disclosing a step to produce an authentication key from a halftone file merely discloses applying a predetermined halftoning process to a digital file to generate a "digital halftone file comprising a plurality of discrete digital values." [Pg. 5, lines 23-35; Emphasis added] Hence, Applicant's amendments to the claims introduce new matter.

Claim Rejections - 35 USC § 103

11. Claims 1-11 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tresser et al. USPN 6,804,373 (hereinafter Tresser).

12. As per claims 1-6, Tresser discloses a method of generating an authentication key for an electronic document file representative of a document, the method comprising:

a. Using a computer system to automatically provide the electronic document file as an initial digital file; (col. 8:56-9:3)

b. submitting the initial digital file by the computer system without intervening transformation directly to a predetermined halftoning process, thereby to generate a digital halftone file; and (9:4-7 and lines 40-44: I(i,j) is converted to

I'(h,v) by averaging gray levels over rectangles of a grid covering image I; I'(h,v) is converted to M(h,v) by a halftoning process)

c. submitting the digital halftone file by the computer system to a predetermined mathematical process to thereby generate the authentication key; (9:7-32; information from M is signed)

d. printing the digital halftone file to provide a tangible copy of the document, and printing with the tangible copy of the document a visible representation of the authentication key; (9:66-10:5; a scannable signature is embedded in the image)

e. displaying the digital halftone file on a user display to provide a visible copy of the document and the authentication key; (10:61-64)

f. wherein the halftoning process is based, at least in part, on an error diffusion halftoning algorithm; (5:30-31 and lines 41-44)

g. wherein the halftoning process is based, at least in part, on one of a matrix-based halftoning algorithm, a pattern-based halftoning algorithm, or an ordered-dither halftoning algorithm; (5:15-41; 9:4-7) and

h. wherein the predetermined mathematical process is a summation process. (6:6-25)

13. Although the embodiment disclosed by Tresser discloses the invention in the context of a black and white printing system, Tresser expressly discloses that the invention is applicable to color and multitone printers. On col. 5, lines 6-40, Tresser discloses:

> Most printers today can print in only a limited number of colors. Digital halftoning is a technique for printing a picture (or more generally displaying it on some two-

> dimensional medium such as a liquid crystal display, etc.) using small dots with a limited number of colors such that it appears to consist of many colors when viewed from a proper distance. For example, a picture of black and white dots can appear to display gray colors when viewed from some distance.
>
> The fastest and most commonly used methods for digital half-toning are dithering algorithms which use threshold arrays (also called dither matrices or dither masks). The principle of this method, as illustrated by FIG. 1, is well known. The method allows associating a matrix N of discrete values at 13 (e.g., typically 0 or 1, where 1 means a pixel is printed, and a 0 means nothing is printed) to an image I at 11 using a dithering mask 12 (a smaller matrix of threshold values). Various masks can be devised, according to the needs of precise applications, and several methods to devise masks with good performance have been disclosed (e.g., see for instance U.S. Pat. No. 5,111,310 to Parker et al., U.S. Pat. No. 5,917,951 to Thompson et al., and U.S. Pat. No. 6,025,930 to Thompson et al.).
>
> Instead of a dithering mask, one can also use other half-toning algorithms such as error diffusion.
>
> Dithering masks as well as error diffusion can be easily adapted to use more than two possible outputs per pixel (i.e., several levels of gray instead of just black and white). This is referred to as multitone printing (with digital printing then referring to black and white pixels only). Also, all these techniques, can be easily adapted to color printing. Both adaptation to multi-tone and to color (digital or multi-tone color) are well known by anyone versed in the art of digital printing.
>
> The present invention will use some half-toning algorithms, whose choice will depend on the preference of the user. More particularly, any of the methods mentioned so far can be chosen. [Emphasis added]

14. See also col. 6:49-53. Furthermore, it is notoriously well known in the art of color halftoning to establish a multi-plane bitmap based on the separation of multiple colors. Traditionally, the colors cyan, magenta, yellow and black, aka CMYK, are used. Official notice is taken that a halftoning process to create a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art. See below for a list of prior art disclosing such a feature; see also applicant's specification pgs. 2-3, which discloses that such principles are well known in the art. In addition, on col. 9, lines 8-19, Tresser discloses:

> At 340, matrix M is interpreted as a data stream, and optionally (selectively) cut into a plurality of pieces (some of which can overlap). These pieces can, for instance, form blocks, not necessarily all of the same size (the blocks may have the same size or may have a different size depending upon the ease versus generality desired by the

> designer), that cover M, or can correspond to intertwined parts of M. Some of the pieces may be processed in an image compression engine at 351, one example of which will be described in more detail below. Other pieces may be processed at 352 by a digital signature scheme such as for instance the RSA scheme.

15. In this case, matrix M is an output of a half-toning procedure for a black and white printer. For an embodiment constituting color or multitone printers, a data structure (M) analogous to the matrix M stores the bit data resulting from the halftone procedure to process the multiple planes of an image for a color or multitone printer. In this case, the digital signature scheme would necessarily apply to a plurality of pieces of the resulting data structure (M). Hence, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tresser such that the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different color ink drops, and wherein the mathematical process includes mathematically combining the multi-plane bitmap to create the authentication key. Because this technique is well-established in the art, one of ordinary skill at the time the invention was made would utilize this type of color halftoning technique to modify the invention of Tresser. In addition, one would be motivated to make these changes to authenticate a color image as taught by Tresser. Col. 6:49-53. The aforementioned cover the limitations of claims 1-6.

16. As per claims 7-11, Tresser discloses a method of authenticating an electronic document file representative of a document, the method comprising:

i. Using a computer system to automatically receive the electronic document file as an initial received digital file; submitting the initial received digital file by the computer system without intervening transformation directly to a predetermined halftoning process, thereby to generate a digital halftone file defined by a plurality of discrete digital values; submitting the digital halftone file by the computer system to a mathematical process involving each of the plurality of discrete digital values in the digital halftone file, thereby produce a receiver-generated authentication key for the initial received digital file; and using the receiver-generated authentication key by the computer system to verify the authenticity of the initial received digital file relative to the electronic document file; wherein the step of using the receiver-generated authentication key comprises: receiving a sender-generated authentication key for the electronic document file; and comparing the sender-generated authentication key to the receiver-generated authentication key; and accepting the authenticity of the initial received digital file relative to the electronic document file, when the sender-generated and the receiver-generated authentication keys are identical; (col. 6:15-26, RSA signatures are generated using a hash of the digital data; 9:63-10:48, especially 10:36-41; the inverse of the signature is a compressed version of N'; embedded matrix M is necessarily transformed to compressed version of half tone N, whereby a match authenticates the document)

j. wherein the halftoning process is based, at least in part, on an error diffusion halftoning algorithm; (5:30-31 and lines 41-44)

k. wherein the halftoning process is based, at least in part, on one of a matrix-based halftoning algorithm, a pattern-based halftoning algorithm, or an ordered-dither halftoning algorithm; and (5:15-41; 9:4-7)

l. wherein the predetermined mathematical process is a summation process. (6:6-25)

17. Although the embodiment disclosed by Tresser discloses the invention in the context of a black and white printing system, Tresser expressly discloses that the invention is applicable to color and multitone printers. On col. 5, lines 6-40, Tresser discloses:

> Most printers today can print in only a limited number of colors. Digital half-toning is a technique for printing a picture (or more generally displaying it on some two-dimensional medium such as a liquid crystal display, etc.) using small dots with a limited number of colors such that it appears to consist of many colors when viewed from a proper distance. For example, a picture of black and white dots can appear to display gray colors when viewed from some distance.
>
> The fastest and most commonly used methods for digital half-toning are dithering algorithms which use threshold arrays (also called dither matrices or dither masks). The principle of this method, as illustrated by FIG. 1, is well known. The method allows associating a matrix N of discrete values at 13 (e.g., typically 0 or 1, where 1 means a pixel is printed, and a 0 means nothing is printed) to an image I at 11 using a dithering mask 12 (a smaller matrix of threshold values). Various masks can be devised, according to the needs of precise applications, and several methods to devise masks with good performance have been disclosed (e.g., see for instance U.S. Pat. No. 5,111,310 to Parker et al., U.S. Pat. No. 5,917,951 to Thompson et al., and U.S. Pat. No. 6,025,930 to Thompson et al.).
>
> Instead of a dithering mask, one can also use other half-toning algorithms such as error diffusion.
>
> Dithering masks as well as error diffusion can be easily adapted to use more than two possible outputs per pixel (i.e., several levels of gray instead of just black and white). This is referred to as multitone printing (with digital printing then referring to black and white pixels only). Also, all these techniques, can be easily adapted to color printing. Both adaptation to multi-tone and to color (digital or multi-tone color) are well known by anyone versed in the art of digital printing.
>
> The present invention will use some half-toning algorithms, whose choice will depend on the preference of the user. More particularly, any of the methods mentioned so far can be chosen. [emphasis added]

18. See also col. 6:49-53. Furthermore, it is notoriously well known in the art of color halftoning to establish a multi-plane bitmap based on the separation of multiple colors. Traditionally, the colors cyan, magenta, yellow and black, aka CMYK, are used. Official notice is taken that a halftoning process to create a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art. See below for a list of prior art disclosing such a feature; see also applicant's specification pgs. 2-3, which discloses that such principles are well known in the art. In addition, on col. 9, lines 8-19, Tresser discloses:

> At 340, matrix M is interpreted as a data stream, and optionally (selectively) cut into a plurality of pieces (some of which can overlap). These pieces can, for instance, form blocks, not necessarily all of the same size (the blocks may have the same size or may have a different size depending upon the ease versus generality desired by the designer), that cover M, or can correspond to intertwined parts of M. Some of the pieces may be processed in an image compression engine at 351, one example of which will be described in more detail below. Other pieces may be processed at 352 by a digital signature scheme such as for instance the RSA scheme.

19. In this case, matrix M is an output of a half-toning procedure for a black and white printer. For an embodiment constituting color or multitone printers, a data structure (M) analogous to the matrix M stores the bit data resulting from the halftone procedure to process the multiple planes of an image for a color or multitone printer. In this case, the digital signature scheme would necessarily apply to a plurality of pieces of the resulting data structure (M). Hence, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tresser such that the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane

bitmap defined by specific placement and size of different color ink drops, and wherein the mathematical process includes mathematically combining the multi-plane bitmap to create the authentication key. Because this technique is well-established in the art, one of ordinary skill at the time the invention was made would utilize this type of color halftoning technique to modify the invention of Tresser. In addition, one would be motivated to make these changes to authenticate a color image as taught by Tresser. Col. 6:49-53. The aforementioned cover the limitations of claims 7-11.

20. As per claim 14, Tresser discloses a system to generate an authentication key for an electronic document file representative of a document, the system comprising: a processor; and a computer readable memory device readable by the processor (fig. 7 and related text), the computer readable memory device containing a series of computer executable steps configured to cause the processor to: retrieve a copy of the electronic document file as an initial digital file (col. 8:56-9:3); submit the initial digital file without intervening transformation directly to a predetermined halftoning process, thereby to generate a digital halftone file (9:4-7 and lines 40-44); submit the digital halftone file to a predetermined mathematical process to thereby generate the authentication key (9:17-19 and lines 25-32); and store a copy of the authentication key in the computer readable memory device. (fig. 3, reference no. 380; 10:53-54)

21. Although the embodiment disclosed by Tresser discloses the invention in the context of a black and white printing system, Tresser expressly discloses that the

invention is applicable to color and multitone printers. On col. 5, lines 6-40, Tresser discloses:

> Most printers today can print in only a limited number of colors. Digital half-toning is a technique for printing a picture (or more generally displaying it on some two-dimensional medium such as a liquid crystal display, etc.) using small dots with a limited number of colors such that it appears to consist of many colors when viewed from a proper distance. For example, a picture of black and white dots can appear to display gray colors when viewed from some distance.
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> The fastest and most commonly used methods for digital half-toning are dithering algorithms which use threshold arrays (also called dither matrices or dither masks). The principle of this method, as illustrated by FIG. 1, is well known. The method allows associating a matrix N of discrete values at 13 (e.g., typically 0 or 1, where 1 means a pixel is printed, and a 0 means nothing is printed) to an image I at 11 using a dithering mask 12 (a smaller matrix of threshold values). Various masks can be devised, according to the needs of precise applications, and several methods to devise masks with good performance have been disclosed (e.g., see for instance U.S. Pat. No. 5,111,310 to Parker et al., U.S. Pat. No. 5,917,951 to Thompson et al., and U.S. Pat. No. 6,025,930 to Thompson et al.).
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> Instead of a dithering mask, one can also use other half-toning algorithms such as error diffusion.
>
> Dithering masks as well as error diffusion can be easily adapted to use more than two possible outputs per pixel (i.e., several levels of gray instead of just black and white). This is referred to as multitone printing (with digital printing then referring to black and white pixels only). Also, all these techniques, can be easily adapted to color printing. Both adaptation to multi-tone and to color (digital or multi-tone color) are well known by anyone versed in the art of digital printing.
>
> The present invention will use some half-toning algorithms, whose choice will depend on the preference of the user. More particularly, any of the methods mentioned so far can be chosen. [emphasis added]

22. See also col. 6:49-53. Furthermore, it is notoriously well known in the art of color halftoning to establish a multi-plane bitmap based on the separation of multiple colors. Traditionally, the colors cyan, magenta, yellow and black, aka CMYK, are used. Official notice is taken that a halftoning process to create a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art. See below for a list of prior art disclosing such a

feature; see also applicant's specification pgs. 2-3, which discloses that such principles are well known in the art. In addition, on col. 9, lines 8-19, Tresser discloses:

> At 340, matrix M is interpreted as a data stream, and optionally (selectively) cut into a plurality of pieces (some of which can overlap). These pieces can, for instance, form blocks, not necessarily all of the same size (the blocks may have the same size or may have a different size depending upon the ease versus generality desired by the designer), that cover M, or can correspond to intertwined parts of M. Some of the pieces may be processed in an image compression engine at 351, one example of which will be described in more detail below. Other pieces may be processed at 352 by a digital signature scheme such as for instance the RSA scheme.

In this case, matrix M is an output of a half-toning procedure for a black and white printer. For an embodiment constituting color or multitone printers, a data structure (M) analogous to the matrix M stores the bit data resulting from the halftone procedure to process the multiple planes of an image for a color or multitone printer. In this case, the digital signature scheme would necessarily apply to a plurality of pieces of the resulting data structure (M). Hence, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tresser such that the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different color ink drops, and wherein the mathematical process includes mathematically combining the multi-plane bitmap to create the authentication key. Because this technique is well-established in the art, one of ordinary skill at the time the invention was made would utilize this type of color hafltoning technique to modify the invention of Tresser. In addition, one would be motivated to make these changes to authenticate a color image as taught by Tresser. Col. 6:49-53. The aforementioned cover the limitations of claim 14.

23. As per claim 15, the rejection of claim 14 under 35 USC 103(a) as being unpatentable over Tresser is incorporated herein. In addition, Tresser further discloses wherein the processor and the computer readable memory device are resident within a document printing device. (col. 1:10-12; fig. 7, reference no. 739)

24. As per claim 16, the rejection of claim 15 under 35 USC 103(a) as being unpatentable over Tresser is incorporated herein. In addition, Tresser further discloses wherein the series of computer executable steps are further configured to cause the processor to print a tangible copy of the halftone image file as the document, and to include the authentication key on the tangible copy of the halftone image file. (Col. 9:66-10:5)

25. As per claim 17, the rejection of claim 14 under 35 USC 103(a) as being unpatentable over Tresser is incorporated herein. In addition, Tresser further discloses wherein the computer readable memory is configured to store, at least temporarily, a copy of the electronic document file as the initial digital document file. (fig. 3, reference no. 380; 10:53-54)

26. As per claim 18, the rejection of claim 15 under 35 USC 103(a) as being unpatentable over Tresser is incorporated herein. In addition, Tresser discloses the system further comprising a user display, and wherein the series of computer

executable steps are further configured to cause the processor to display the authentication key on the user display. (Col. 10:61-64)

Claim Rejections - 35 USC § 103

27. Claims 12 and 13 are rejected under 35 USC 103(a) as being unpatentable over Tresser in view of Linsker et al. USPN 5,598,473 (hereinafter Linsker).

28. As per claims 12 and 13, the rejections of claims 9 and 10 as being unpatentable over Tresser are incorporated herein. Tresser does not disclose wherein the electronic document file is received from a sender via a network and wherein the sender authentication key is received via one of telephone or facsimile. Linsker discloses using an authentication key to verify the integrity of a fax transmission from a sender to a receiver. The authentication key is based on a digest of a digital document and signature of the digest, which is appended to the document and faxed to the receiver. The receiver recovers the first digest from the signature then performs an operation on the digital document to create a second digest, wherein a match between the first and second digest shows that the document is authentic. Col. 6:33-8:15. It would be obvious to one of ordinary skill in the art at the time the invention was made for the electronic document file of Tresser to be received from a sender via a network and wherein the sender authentication key is received via one of telephone or facsimile. One would be motivated to do so to ensure the authenticity of documents transmitted via fax using an authentication key derived from halftoning digital information, a process

that provides the requisite security, whether or not the document was scanned properly. (Linsker, 1:43-55; Tresser, 3:49-55) The aforementioned cover the limitations of claims 12 and 13.

29. Claims 19, 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tresser in view of Brundage et al. US Patent Application Publication No. 20040181671 (hereinafter Brundage).

30. As per claim 19, Tresser discloses a system for authenticating an electronic document file representative of a document, the system comprising: a processor; a computer readable memory device readable by the processor (fig. 7 and related text) and configured to receive the electronic document file as an initial received digital file; the computer readable memory device containing a series of computer executable steps configured to cause the processor to: store the initial received digital file in the computer readable memory device; submit the initial digital file without intervening transformation directly to a predetermined halftoning process, thereby to generate a digital halftone file defined by a plurality of discrete digital values; submit the digital halftone file to a predetermined mathematical process involving each of the plurality of discrete digital values in the digital halftone file to thereby produce a receiver-generated authentication key for the initial received digital file. (col. 6:15-26, RSA signatures are generated using a hash of the digital data; col. 9:63-10:48, especially 10:36-41; the

inverse of the signature is a compressed version of N'; embedded matrix M is transformed to compressed version of half tone N, a match authenticates the document)

31. Although the embodiment disclosed by Tresser discloses the invention in the context of a black and white printing system, Tresser expressly discloses that the invention is applicable to color and multitone printers. On col. 5, lines 6-40, Tresser discloses:

> Most printers today can print in only a limited number of colors. Digital half-toning is a technique for printing a picture (or more generally displaying it on some two-dimensional medium such as a liquid crystal display, etc.) using small dots with a limited number of colors such that it appears to consist of many colors when viewed from a proper distance. For example, a picture of black and white dots can appear to display gray colors when viewed from some distance.
>
> The fastest and most commonly used methods for digital half-toning are dithering algorithms which use threshold arrays (also called dither matrices or dither masks). The principle of this method, as illustrated by FIG. 1, is well known. The method allows associating a matrix N of discrete values at 13 (e.g., typically 0 or 1, where 1 means a pixel is printed, and a 0 means nothing is printed) to an image I at 11 using a dithering mask 12 (a smaller matrix of threshold values). Various masks can be devised, according to the needs of precise applications, and several methods to devise masks with good performance have been disclosed (e.g., see for instance U.S. Pat. No. 5,111,310 to Parker et al., U.S. Pat. No. 5,917,951 to Thompson et al., and U.S. Pat. No. 6,025,930 to Thompson et al.).
>
> Instead of a dithering mask, one can also use other half-toning algorithms such as error diffusion.
>
> Dithering masks as well as error diffusion can be easily adapted to use more than two possible outputs per pixel (i.e., several levels of gray instead of just black and white). This is referred to as multitone printing (with digital printing then referring to black and white pixels only). Also, all these techniques, can be easily adapted to color printing. Both adaptation to multi-tone and to color (digital or multi-tone color) are well known by anyone versed in the art of digital printing.
>
> The present invention will use some half-toning algorithms, whose choice will depend on the preference of the user. More particularly, any of the methods mentioned so far can be chosen. [emphasis added]

32. See also col. 6:49-53. Furthermore, it is notoriously well known in the art of color halftoning to establish a multi-plane bitmap based on the separation of multiple colors. Traditionally, the colors cyan, magenta, yellow and black, aka CMYK, are used. Official notice is taken that a halftoning process to create a mixture of varying intensities of

plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art. See below for a list of prior art disclosing such a feature; see also applicant's specification pgs. 2-3, which discloses that such principles are well known in the art. In addition, on col. 9, lines 8-19, Tresser discloses:

> At 340, matrix M is interpreted as a data stream, and optionally (selectively) cut into a plurality of pieces (some of which can overlap). These pieces can, for instance, form blocks, not necessarily all of the same size (the blocks may have the same size or may have a different size depending upon the ease versus generality desired by the designer), that cover M, or can correspond to intertwined parts of M. Some of the pieces may be processed in an image compression engine at 351, one example of which will be described in more detail below. Other pieces may be processed at 352 by a digital signature scheme such as for instance the RSA scheme.

33. In this case, matrix M is an output of a half-toning procedure for a black and white printer. For an embodiment constituting color or multitone printers, a data structure (M) analogous to the matrix M stores the bit data resulting from the halftone procedure to process the multiple planes of an image for a color or multitone printer. In this case, the digital signature scheme would necessarily apply to a plurality of pieces of the resulting data structure (M). Hence, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tresser such that the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different color ink drops, and wherein the mathematical process includes mathematically combining the multi-plane bitmap to create the authentication key. Because this technique is well-established in the art, one of ordinary skill at the time the invention was made would utilize this type of color

halftoning technique to modify the invention of Tresser. In addition, one would be motivated to make these changes to authenticate a color image as taught by Tresser. Col. 6:49-53.

34. In addition, Tresser does not disclose displaying a copy of the receiver-generated authentication key on one of a printer or a user display. Brundage discloses a system for authenticating identification documents using a watermark, wherein an authenticator displays the watermark information to a user to allow an inspector or officer to visually compare the watermark information against information printed on the document. Paragraph 62. It would be obvious to one of ordinary skill in the art at the time the invention was made to display a copy of the receiver-generated authentication key on one of a printer or a user display. One would be motivated to do so to enable a human to quantify the authenticity of the document as taught by Brundage, ibid. The aforementioned cover the limitations of claim 19.

35. As per claim 22, the rejection of claim 19 under 35 USC 103(a) as being unpatentable over 35 USC 103(a) is incorporated herein. In addition, Tresser discloses wherein the processor and the computer readable memory device are resident within a document printing device. (col. 1:10-12; fig. 7, reference no. 739)

36. As per claim 23, Tresser discloses an system to authenticate an electronic document file, comprising:

m. a sender computer configured to provide the electronic document file in the form of a sender initial digital file; a sender printer configured to: receive the sender initial digital file; submit the sender initial digital file without intervening transformation directly to a predetermined halftoning process, thereby to generate a first digital halftone file; submit the first digital halftone file to a predetermined mathematical process to thereby generate a sender authentication key; and display the sender authentication key to a sender; (col. 8:56-9:44; 10:61-64)

n. a receiver computer configured to receive the electronic document file from the sender as a receiver initial digital file; a receiver printer configured to: receive the receiver initial digital file; submit the receiver initial digital file without intervening transformation directly to the predetermined halftoning process, thereby to generate a second digital halftone file; submit the second digital halftone file to the predetermined mathematical process to thereby generate a receiver authentication key. (col. 9:63-10:48, especially 10:36-41; the inverse of the signature is a compressed version of N'; embedded matrix M is transformed to compressed version of half tone N, a match authenticates the document)

37. Although the embodiment disclosed by Tresser discloses the invention in the context of a black and white printing system, Tresser expressly discloses that the invention is applicable to color and multitone printers. On col. 5, lines 6-40, Tresser discloses:

> Most printers today can print in only a limited number of colors. Digital half-toning is a technique for printing a picture (or more generally displaying it on some two-

> dimensional medium such as a liquid crystal display, etc.) using small dots with a limited number of colors such that it appears to consist of many colors when viewed from a proper distance. For example, a picture of black and white dots can appear to display gray colors when viewed from some distance.
>
> The fastest and most commonly used methods for digital half-toning are dithering algorithms which use threshold arrays (also called dither matrices or dither masks). The principle of this method, as illustrated by FIG. 1, is well known. The method allows associating a matrix N of discrete values at 13 (e.g., typically 0 or 1, where 1 means a pixel is printed, and a 0 means nothing is printed) to an image I at 11 using a dithering mask 12 (a smaller matrix of threshold values). Various masks can be devised, according to the needs of precise applications, and several methods to devise masks with good performance have been disclosed (e.g., see for instance U.S. Pat. No. 5,111,310 to Parker et al., U.S. Pat. No. 5,917,951 to Thompson et al., and U.S. Pat. No. 6,025,930 to Thompson et al.).
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> Instead of a dithering mask, one can also use other half-toning algorithms such as error diffusion.
>
> Dithering masks as well as error diffusion can be easily adapted to use more than two possible outputs per pixel (i.e., several levels of gray instead of just black and white). This is referred to as multitone printing (with digital printing then referring to black and white pixels only). Also, all these techniques, can be easily adapted to color printing. Both adaptation to multi-tone and to color (digital or multi-tone color) are well known by anyone versed in the art of digital printing.
>
> The present invention will use some half-toning algorithms, whose choice will depend on the preference of the user. More particularly, any of the methods mentioned so far can be chosen. [emphasis added]

38. See also col. 6:49-53. Furthermore, it is notoriously well known in the art of color halftoning to establish a multi-plane bitmap based on the separation of multiple colors. Traditionally, the colors cyan, magenta, yellow and black, aka CMYK, are used. Official notice is taken that a halftoning process to create a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different colored ink drops is well known in the art. See below for a list of prior art disclosing such a feature; see also applicant's specification pgs. 2-3, which discloses that such principles are well known in the art. In addition, on col. 9, lines 8-19, Tresser discloses:

> At 340, matrix M is interpreted as a data stream, and optionally (selectively) cut into a plurality of pieces (some of which can overlap). These pieces can, for instance, form blocks, not necessarily all of the same size (the blocks may have the same size or may have a different size depending upon the ease versus generality desired by the

> designer), that cover M, or can correspond to intertwined parts of M. Some of the pieces may be processed in an image compression engine at 351, one example of which will be described in more detail below. Other pieces may be processed at 352 by a digital signature scheme such as for instance the RSA scheme.

39. In this case, matrix M is an output of a half-toning procedure for a black and white printer. For an embodiment constituting color or multitone printers, a data structure (M) analogous to the matrix M stores the bit data resulting from the halftone procedure to process the multiple planes of an image for a color or multitone printer. In this case, the digital signature scheme would necessarily apply to a plurality of pieces of the resulting data structure (M). Hence, it would be obvious to one of ordinary skill in the art at the time the invention was made to modify the invention of Tresser such that the halftoning process creates a mixture of varying intensities of plural color planes with layered variable intensities of the plural color planes to form a colored multi-plane bitmap defined by specific placement and size of different color ink drops, and wherein the mathematical process includes mathematically combining the multi-plane bitmap to create the authentication key. Because this technique is well-established in the art, one of ordinary skill at the time the invention was made would utilize this type of color halftoning technique to modify the invention of Tresser. In addition, one would be motivated to make these changes to authenticate a color image as taught by Tresser. Col. 6:49-53.

40. In addition, Tresser does not disclose displaying a copy of the authentication key to a user via one of a printer or a user display. Brundage discloses a system for authenticating identification documents using a watermark, wherein an authenticator displays the watermark information to a user to allow an inspector or officer to visually

compare the watermark information against information printed on the document. Paragraph 62. It would be obvious to one of ordinary skill in the art at the time the invention was made to display a copy of the authentication key to a user via one of a printer or a user display. One would be motivated to do so to enable a human to quantify the authenticity of the document as taught by Brundage, ibid. The aforementioned cover the limitations of claim 23.

41. Claims 20, 21, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tresser in view of Brundage and further in view of Linsker.

42. As per claims 20 and 21, the rejection of claim 19 under 35 USC 103(a) as being unpatentable over Tresser and Brundage are incorporated herein. Tresser does not disclose the system further comprising a modem configured to process the initial received digital file from a sender and communicate the initial received digital file to the computer readable memory device by way of the processor; and one of a telephone or a facsimile machine configured to receive a sender-generated authentication key for the electronic document file capable of being compared to the receiver-generated authentication key to authenticate the initial received digital file relative to the electronic document file. Linsker discloses using an authentication key to verify the integrity of a fax transmission from a sender to a receiver. The authentication key is based on a digest of a digital document and signature of the digest, which is appended to the document and faxed to the receiver. The receiver recovers the first digest from the

signature then performs an operation on the digital document to create a second digest, wherein a match between the first and second digest shows that the document is authentic. Col. 6:33-8:15. It would be obvious to one of ordinary skill in the art at the time the invention was made for the system of Tresser to further comprise a modem configured to process the initial received digital file from a sender and communicate the initial received digital file to the computer readable memory device by way of the processor; and one of a telephone or a facsimile machine configured to receive a sender-generated authentication key for the electronic document file capable of being compared to the receiver-generated authentication key to authenticate the initial received digital file relative to the electronic document file. One would be motivated to do so to ensure the authenticity of documents transmitted via fax using an authentication key derived from halftoning digital information, a process that provides the requisite security, whether or not the document was scanned properly. (Linsker, 1:43-55; Tresser, 3:49-55) The aforementioned cover the limitations of claims 20 and 21.

43. As per claims 24 and 25, the rejection of claim 23 under 35 USC 103(a) as being unpatentable over Tresser and Brundage are incorporated herein. Tresser does not disclose the system further comprising a network connection configurable to allow the sender computer to send the sender initial digital file to the receiver computer; and a sender telephone and a receiver telephone together allowing the sender to communicate the sender authentication key to the receiver; or a sender facsimile

machine and a receiver facsimile machine together allowing the sender to communicate the sender authentication key to the receiver. Linsker discloses using an authentication key to verify the integrity of a fax transmission from a sender to a receiver. The authentication key is based on a digest of a digital document and signature of the digest, which is appended to the document and faxed to the receiver. The receiver recovers the first digest from the signature then performs an operation on the digital document to create a second digest, wherein a match between the first and second digest shows that the document is authentic. Col. 6:33-8:15. It would be obvious to one of ordinary skill in the art at the time the invention was made for the system of Tresser to further comprise a network connection configurable to allow the sender computer to send the sender initial digital file to the receiver computer; and a sender telephone and a receiver telephone together allowing the sender to communicate the sender authentication key to the receiver; or a sender facsimile machine and a receiver facsimile machine together allowing the sender to communicate the sender authentication key to the receiver. One would be motivated to do so to ensure the authenticity of documents transmitted via fax using an authentication key derived from halftoning digital information, a process that provides the requisite security, whether or not the document was scanned properly. (Linsker, 1:43-55; Tresser, 3:49-55) The aforementioned cover the limitations of claims 24 and 25.

Conclusion

44. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior discloses

45. Riley et al. US 6,307,972 discloses that the technique of scanning an original continuous tone image to generate cyan, magenta, yellow and black grayscale representations of the image, converting the grayscale representations into binary form suitable for printing, and then printing the bitmap on film is well known. See col. 2:15-29.

46. Shibuya et la. US 5,867,607 discloses a digital halftoning apparatus and method that decomposes an input image into four color planes, and uses a dither matrix to generate binary data, which is used to generate output data. See col. 5, lines 22-50.

47. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Communications Inquiry

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JUNG KIM whose telephone number is (571)272-3804. The examiner can normally be reached on FLEX.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gilberto Barron can be reached on 571-272-3799. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jung Kim/
Primary Examiner, AU 2432